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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/079,135	02/20/2002	Jing-Jong Pan	020858-000300	7016

26541 7590 09/12/2003

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EXAMINER
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SONG, SARAH U

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 09/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

### Application No.

10/079,135

### Applicant(s)

PAN, JING-JONG

### Examiner

Sarah Song

### Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of **50 to 150 words**. **It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited.** The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

### *Claim Objections*

2. Claims 3-7 and 16 objected to because of the following informalities: Claim 3 recites "metal sleeves" although only a single metal sleeve is disclosed. Claims 4-7 inherit the same discrepancy. For purposes of examination, the claim will be interpreted as comprising a single metal sleeve. Claim 16 is incomplete. For purposes of examination, the blank space between "least" and "multimode" will be interpreted as – 300—based on line 28 of page 6 in the disclosure. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1, 8-17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emkey et al. (U.S. Patent 4,701,011) in view of Thual et al. (U.S. Patent 6,014,483) and Wu (U.S. Patent 6,280,099).** Emkey et al. discloses a miniature

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fiber optic device comprising a first optical fiber 12<sub>i</sub>; a multimode optical fiber segment 16<sub>i</sub> attached to an end of said first optical fiber, said first multimode optical fiber segment having a graded index of refraction and axially aligned with said first optical fiber, said multimode optical fiber segment 16<sub>i</sub> having a length; a second optical fiber 12<sub>o</sub>; a multimode optical fiber segment 16<sub>o</sub> attached to an end of said second optical fiber, said third multimode optical fiber segment 16<sub>o</sub> having a step index of refraction or a graded index of refraction and axially aligned with said second optical fiber, said multimode optical fiber segment 16<sub>o</sub> having a length; and an optical component element 30; said first optical fiber 12<sub>i</sub>, said multimode optical fiber segment 16<sub>i</sub>, said element 30, said second optical fiber 12<sub>o</sub>, and multimode optical fiber segment 16<sub>o</sub> arranged and oriented with each other so light from said core of said first optical fiber passing through the element enters said core of said second optical fiber.

5. Emkey et al. does not disclose a multimode optical fiber segment having a step index of refraction attached between the optical fibers and the multimode segments having the graded index of refraction. Emkey et al. also does not specifically disclose a plurality of dielectric coatings on an end of an optical fiber segment for forming a wavelength dependent optical filter.

6. Thual et al. discloses an optical coupler comprising a multimode optical fiber segment having a step index of refraction and a length attached between the optical fibers and the multimode segments having the graded index of refraction. The multimode fiber segments having the step index of refraction in combination with the multimode fiber segments having the graded index of refraction define a collimation and focusing function for light from and to the optical fibers. The fiber collimator of Thual et al.

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achieves a larger mode diameter compared to other miniature fiber collimators. It would have been obvious to modify the disclosure of Emkey et al. to incorporate the step-index multimode fiber segments in between the optical fibers and the graded-index multimode fiber segments of Emkey et al. to increase the mode diameter and improve coupling efficiency of the coupler as taught by Thual et al. (see column 4, lines 55-56; column 5, lines 21-29).

7. Wu discloses a wavelength filter comprising a plurality of dielectric coatings 9 deposited on an end of an optical fiber segment for forming a wavelength-dependent optical filter. It would have been obvious to provide a plurality of dielectric coatings of Wu on the end of the multimode fiber segment in place of element 30 of Emkey et al. to provide a wavelength filter having improved coupling efficiency and reduced size.

8. Regarding claims 8-10, the various types of filters are not explicitly disclosed. It would have been obvious to one having ordinary skill in the art to form a low-pass filter, a high-pass filter, or a bandpass filter since the various filters were known in the art to have specific filtering properties.

9. Regarding claim 13, the method would have been obvious as setting forth requisite steps for providing the device as disclosed.

10. Regarding claims 17 and 18, the claimed lengths are not explicitly disclosed. It would have been obvious to one having ordinary skill in the art to select any desired length for the multimode fiber segments since it was known that the lensing characteristics were dependent on the length of the segments.

11. Regarding claims 11 and 12, Wu additionally discloses angled end faces and reciprocally angled end faces for opposed components. It would have been obvious to

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provide the second multimode optical fiber segment and the fourth multimode optical fiber segment with reciprocally angled end faces since it was known in the art that angled end faces to reduce reflection and insertion loss and terminal end faces.

12. Regarding claims 14, the method would have been obvious as setting forth a requisite step for providing the angled end faces disclosed by Wu.

13. Regarding claims 15 and 16, the step of simultaneously polishing end surface of a plurality of segments (e.g. 300 segments) in a fixture having an angle-polishing guide surface is not specifically disclosed. Fixtures having angle-polishing guides are known in the art for reproducibly providing an angled end face and would have been obvious to one having ordinary skill in the art. Furthermore, it would have been obvious to polish at least 300 fiber segments simultaneously since it was known that manufacturing in bulk reduces production costs and time.

14. **Claims 2-7, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emkey et al. in view of Thual et al. and Wu as applied to claim 1 or 13 as applicable above, and further in view of Ravetti (U.S. Patent 5,134,470).**

Neither Emkey et al., Thual et al., nor Wu specifically disclose a cylindrical package holding an end section of said first optical fiber, said first multimode optical fiber segment, said second multimode optical fiber segment, an end section of said second optical fiber, said third multimode optical fiber segment, said fourth multimode optical fiber segment, said cylindrical package having an outside diameter less than 0.4mm.

Neither Emkey et al., Thual et al., nor Wu specifically disclose metal-coated optical fibers.

15. Ravetti discloses an optical fiber interconnection comprising metal coated optical fibers and a cylindrical metal-coated glass capillary (i.e. metal sleeve) engaging portions of the end sections of optical fibers having a metal coating thereon (column 6, lines 6-13). Ravetti discloses a compact, low-profile package. It would have been obvious to one having ordinary skill in the art to provide the compact low-profile package of Ravetti to provide additional stability and ruggedness to the device without significantly increasing the size of the device. It is additionally noted that a fully metal sleeve would have been substantially equivalent to the metal-coated glass capillary and thus would have been obvious to one having ordinary skill in the art. Ravetti further discloses the diameter of the sleeve to be 125  $\mu\text{m}$  (see Example).

16. Regarding claim 4, it is noted that the package has circular cross-section.

17. Regarding claims 5-7, it is noted that each metal coating is fixed to the metal sleeve by metal solder. Laser solder and laser welding are not specifically disclosed. It would have been within the level of ordinary skill in the art to use any well-known means to secure the metal-coated fibers to the metal sleeve since applicant has not demonstrated any criticality for the particular means of affixing the fibers to the package.

18. Regarding claims 19 and 20, the method would have been obvious as setting forth requisite steps for providing the device as discussed above

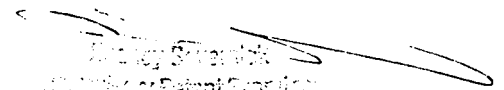
### ***Conclusion***

19. Any inquiry concerning the merits of this communication should be directed to Examiner Sarah Song at telephone number 703-306-5799. Any inquiry of a general or clerical nature, or relating to the status of this application or proceeding should be

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directed to the receptionist at telephone number 703-308-0956 or to the technical support staff supervisor at telephone number 703-308-3072.

  
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William S. Verrill  
Patent Attorney  
Patent Center 2800